REMARKS

The Office Action of February 3, 2011, has been carefully reviewed, and in view of the above amendments and the following remarks, reconsideration and allowance of the pending claims are respectfully requested.

In the above Office Action, Claims 1-2, 10-14, 17-19, 21, 33-37, 41-43, 61-66, 75-76 and 78 stand rejected under 35 USC 103 as being unpatentable over Damadian '490 in view of Eckels et al.. Claims 1-2, 5-8, 10-22, 24-30, 32-54, 61-82, 89-118 and 139-151 stand rejected under 35 USC 103 as being unpatentable over Damadian '490, '165, and 574, Eckels and Carter. For at least the following reasons, Applicants respectfully traverse these rejections.

As set forth above, claim 1 is directed to a magnetic resonance imaging apparatus comprising a magnetic structure having two opposite and spaced apart poles and a column or wall transverse to the poles and connecting the poles; the poles defining two opposite walls delimiting a patient-imaging space, the two opposite walls extending along substantially parallel planes which are substantially parallel to a vertical plane; the magnetic structure further comprising a magnetic structure supporting basement having two lateral walls to which the magnetic structure is rotatably connected at a rotation axis of the poles; the poles being provided at two opposite free ends of a U-shaped yoke, a central branch of the yoke being oriented horizontally and substantially parallel to the rotation axis, which central branch of the U-shaped yoke supports the table supporting frame in a slidable way along a longitudinal direction of the table; the two opposite free ends of the U-shaped yoke support the poles and are hinged around a common axis of rotation to the lateral walls of the supporting basement of the magnetic structure; and

a patient positioning table which is slidably connected to a table supporting frame between the two poles; the table supporting frame being supported by the magnetic structure; the table being positioned with its longitudinal axis substantially parallel to the two opposite parallel walls of the poles and the table being oriented with its transverse axis substantially perpendicular to at least one of the two opposite walls; the table being slidable with respect to the magnetic structure in a direction parallel to a longitudinal axis of the table; manual or automatic means being provided for displacing the table relative to the magnetic structure along the longitudinal axis; a lock for locking the table in a selected position relative to the magnetic structure; manual or automatic means being provided for rotating the frame about the longitudinal axis; the frame with the table and the magnetic structure being rotatable together from a position in which the table is substantially horizontal to a position in which the table is substantially vertical, and vice versa; wherein the entire magnetic structure is supported rotatably together with the table supporting frame around the same axis, wherein the axis of rotation of the table supporting frame and of at least the poles of the magnetic structure substantially coincides with a central axis of the poles.

With reference to Figure 3 from the present application, the table supporting frame 4 is supported, in a slidable manner parallel to the longitudinal axis of the table 3, by the magnetic structure and particularly by the yoke 102. The table can rotate around its central longitudinal axis as indicated by arrow

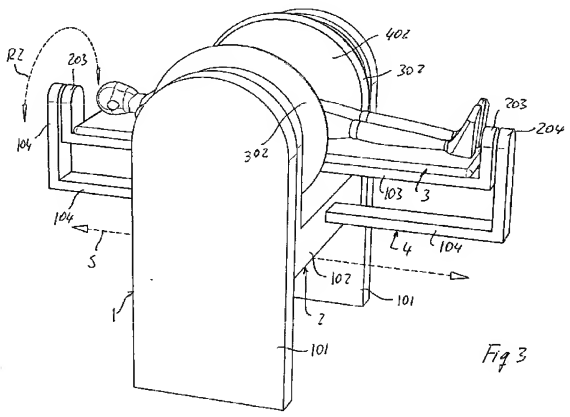


Fig 3

R2. The magnetic structure 2 (including at least the yoke 102 and also possibly the poles 302) rotate around an axis which is perpendicular to the longitudinal axis of the table. Thus, the table 3 and the magnetic structure 2 can both rotate ***together*** around an horizontal axis perpendicular to the poles 302 and to the longitudinal axis of the table. See, Figures 3-5.

In summary, the claimed MRI apparatus is characterised by the combination of the following features:

a) an open magnet (two opposite and parallel poles defining a patient-imaging space, i.e., gap)

b) a patient table supported by the magnet (yoke or a structure supporting the poles which can be formed by the yoke)

c) a magnet (yoke and/or only poles eventually together with the pole supporting structure which can be formed by the yoke) which is rotatable together with the patient bed.

d) particular geometrical relationships between poles and patient table, namely:

1. Vertical poles

2. longitudinal axiis of bed parallel to the vertical poles;

3. common rotational axis of the bed and of the poles;

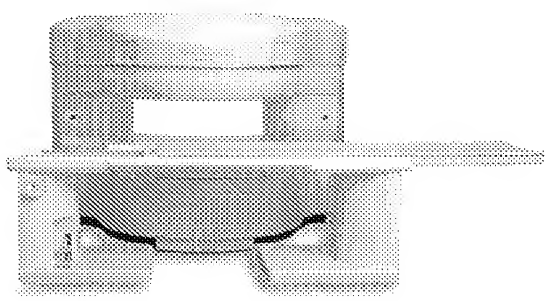
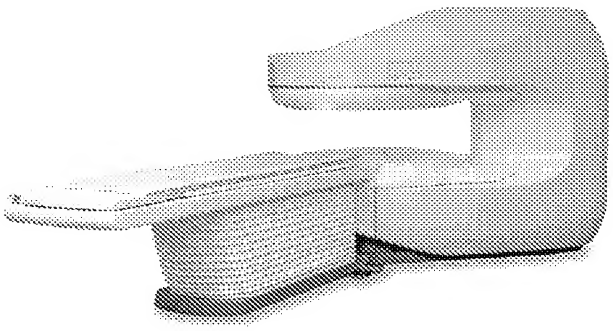
4. axis of rotation coinciding with the central axis of the pole surfaces, i.e., the axis connecting the center of the pole surfaces and which is perpendicular to the said pole surfaces;

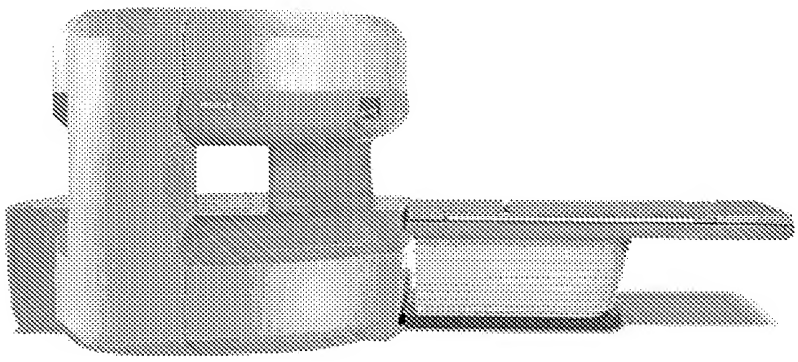
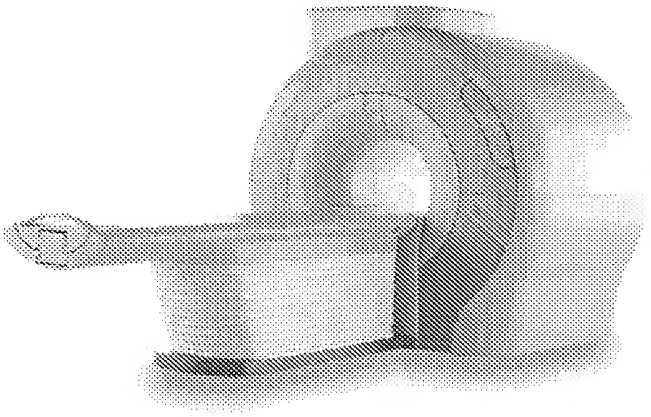
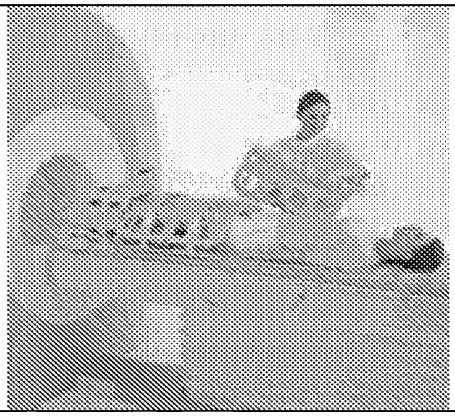
5. further rotational axis of the bed coinciding with the longitudinal axis of the bed.

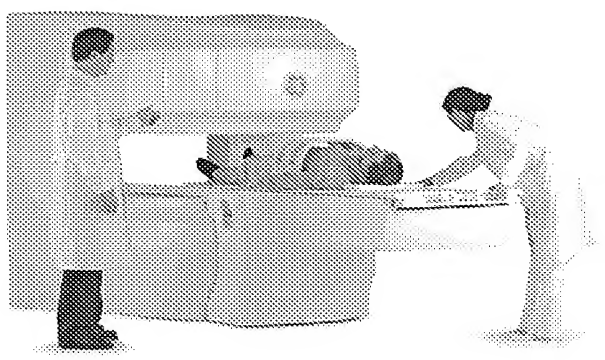
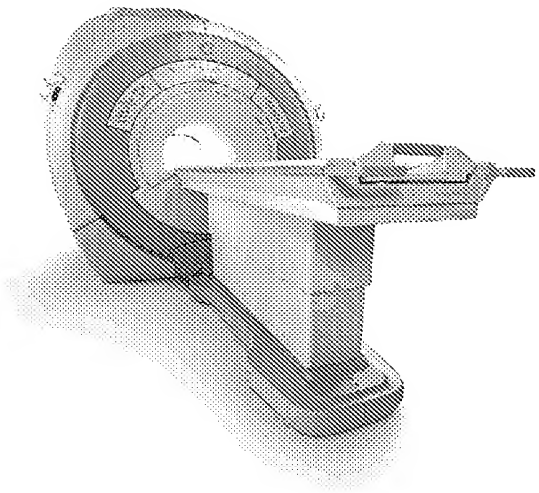
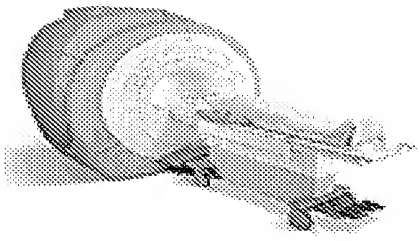
6. the bed further slidable relative to the poles in a direction parallel to the longitudinal axis.

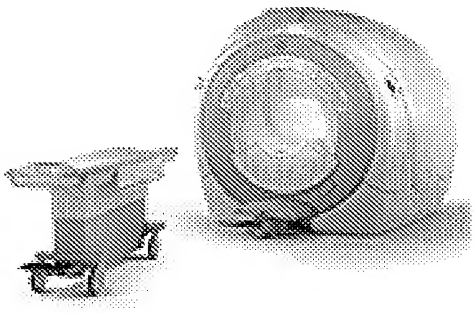
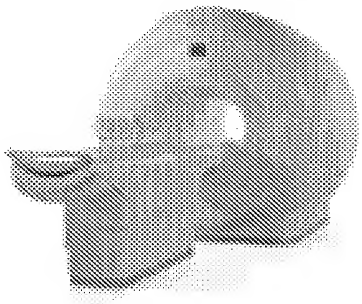
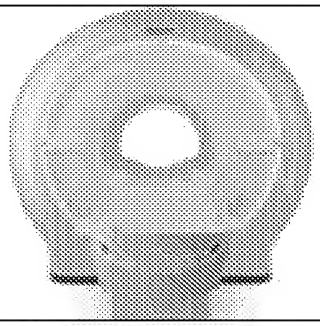
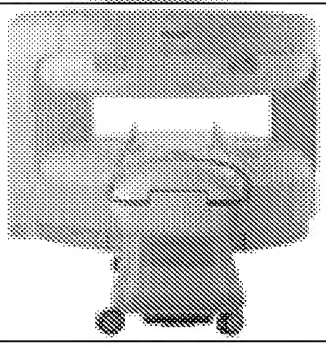
The Examiner's position is that is it obvious to one of ordinary skill in the art to integrate the magnetic structure and the table supporting frame since combining elements is will within the skill level of one of ordinary skill in the art. Applicants respectfully disagree as the cited prior art teaches completely away from this concept, since there is not a single one of the cited references that teaches away from having completely separate bearing structures for the bed and for the magnet or the poles when the patient has to be tilted around at least one axis. The cited references also lack any suggestion to integrate the and magnet.

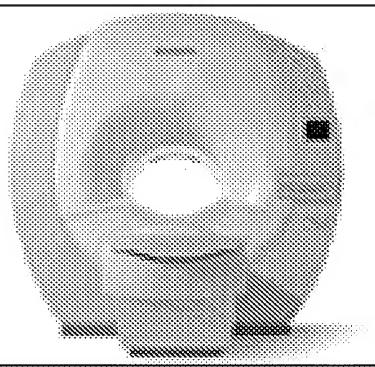
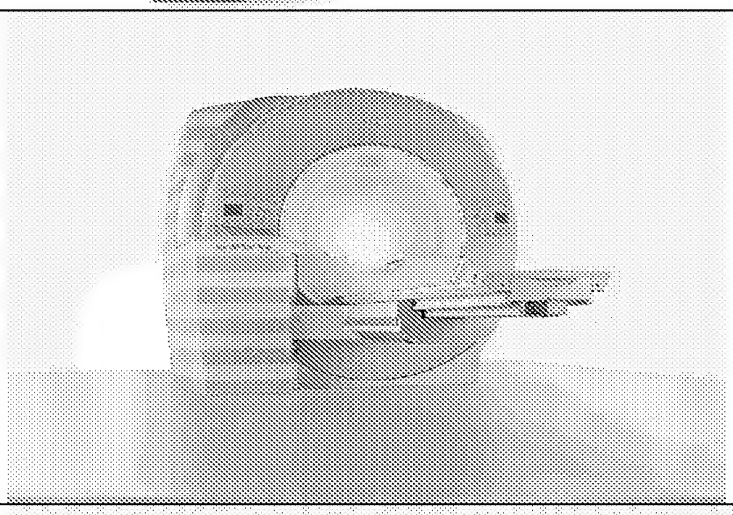
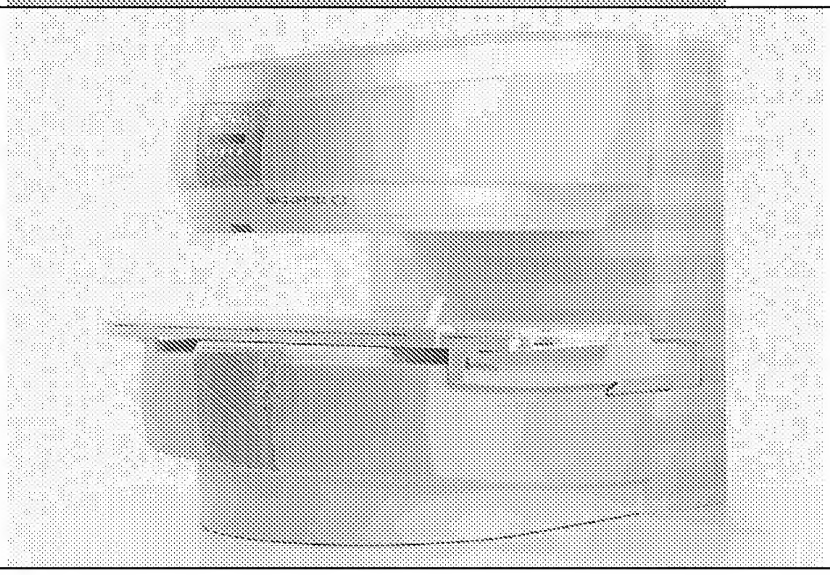
More particularly, the prior art documents only suggest a patient table completely separated from the MRI apparatus and a patient table and MRI apparatus which do not even have an indirect link or integration of their displacements which can generate a rotation of the magnet or of the poles corresponding to a rotation of the patient table when the table is rotated or vice versa. Hence, current existing structures are very different from the claimed one. The magnet is a closed one, i.e. having a tubular or annular shape and the patient has to be inserted in the magnet by an axial displacement from a position out of the magnet to a position in which at least one part of the body is inside the gantry of the magnet. The bed is not supported by the magnet but by a pedestal which is axially beside the magnet and which has rails or guides oriented in the axial direction of the magnet on which a bed is slidable. Examples of known MRI apparatus at the time of the present invention are shown below:

Hitachi Vento	
Hitachi Vento	
Hitachi Aperto	

Hitachi Oasis	
Hitachi Echelon	
TOSHIBA ATLAS VANTAGE	

GE Briva	
GE HERO	
GE SIGMA	

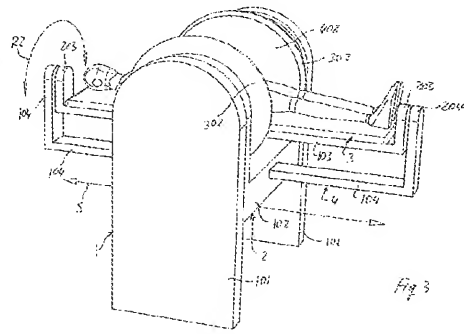
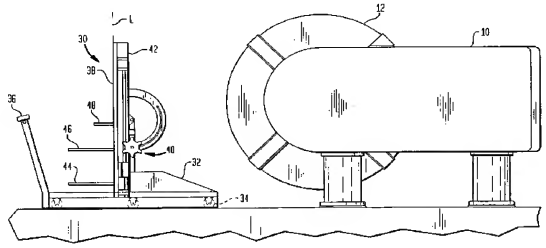
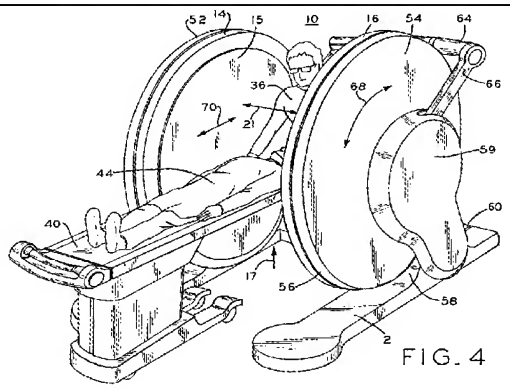
GE Optima	
Philips Achieva	
Philips Ingenia	
Philips Panorama	

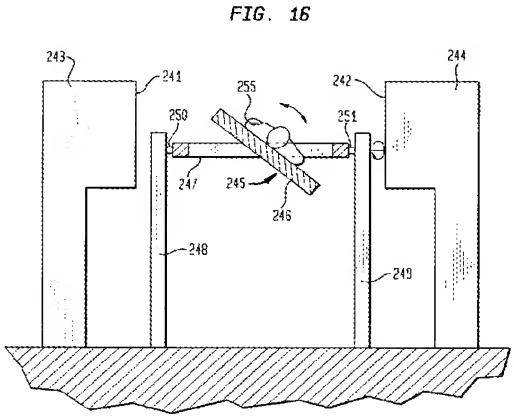
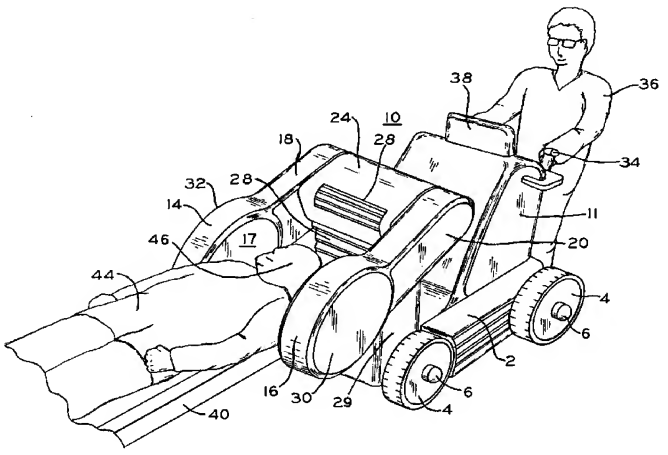
Philips Intera	
Siemens Magentom	
	

The Examiner will note that in the above structures, the bed is not supported by the magnet as in the claimed invention, but by a pedestal which is axially beside

the magnet and which has rails or guides oriented in the axial direction of the magnet on which a bed is slidable.

The prior art cited by the Examiner also discloses a separation of the carriage from the magnet, as demonstrated below:

Present invention	Cited references
	
Carriage separated from magnet	
Carriage separated from magnet	 FIG. 4

Supporting structure separated from magnet which is stationary while patient table rotates within its supporting structure	
Bed and magnet are completely separated. Bed is not tiltable and magnet is mounted tiltable on a carriage.	

Applicants respectfully submit that even taking the technical teaching of all the cited documents together, one skilled in the art would still not be able to reach a configuration as the one claimed.

On the contrary, the prior art would lead one away from the claimed invention and would strengthen the idea that in order to be able to rotate the patient with its bed along at least one axis, an integration of the patient table or bed and the magnet structure is not possible and thus, one skilled in the art would be led in a direction of separating the patient table from the magnet structure.

Furthermore, no suggestion is given in the prior on how to integrate the bed supporting means and the magnet structure in such a way as being able to rotate the bed and magnet together and in the same way. In fact, the entire concept of being able to "rotate together patient table and magnet or at least poles" is not disclosed in any of the cited documents and nor taught by the public prior art.

Hence, there is inadequate evidence to support the Office Action's conclusion that it would have been obvious to one skilled in the art to modify Damadian et. al. '490 to integrate the magnetic structure and the table supporting frame. The Office merely states that the modification would have been obvious and well within the skill level of one of ordinary skill in the art. This conclusory statement is insufficient to support an obviousness rejection, particularly taking into account the Patent Office's Examination Guidelines for Determining Obviousness Under 35 U.S.C. §103(a) in view of KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1396 (2007). The Guidelines state that the Examiner should clearly articulate why the claimed invention would have been obvious. For example, the Supreme Court in KSR held that the Examiner "must [provide] some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." KSR, at 1396. The Supreme Court noted that an invention "composed of several elements is not proved obvious merely be demonstrating that each of its elements was, independently, known in the art." Id. To establish obviousness, it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." Id. In this case, it is not at all apparent why one would have been led to the stated modification, especially in view of the state of the art at the time the invention was made as evidenced above. Simply because

something could have been modified and a person of ordinary skill was capable of making the modification does not mean it would have been obvious to do so. Therefore, there is inadequate evidence supporting the conclusion that it would have been obvious to modify Damadian et al. '490 in a manner to arrive at the claimed invention.

Applicants contend that the gap between the state of the art and the claimed invention cannot be filled by the information available in the prior art, since the simple generic knowledge that some patient beds were somehow linked to the magnetic structure, i.e. relative to configurations which will not allow rotation of the bed and/or of the magnet, does not provide the necessary motivation or suggestion to arrive at the claimed invention.

The claimed invention also has certain goals and technical advantages not realized by the cited prior art.

In a first instance, magnets as the one of Eckels are unlikely to function in such a way as to be able to produce diagnostic useful images. The problem in MRI is the field strength and the magnets are not as highly developed that their dimension can be reduced to the one illustrated in Eckels. Particularly for functional MRI diagnostics and for diagnostic imaging in orthopaedics, high field strengths are needed which simply cannot be generated by such devices as disclosed in Eckels.

The MRI apparatus of the claimed invention is particularly dedicated to spine diagnosis which is an application in orthopaedics, since no functional analysis or image is needed. This kind of MRI apparatus should be of reduced dimensions, low costs, low weight and allow as many imaging protocols as possible, particularly also

of other anatomical parts. Weight bearing imaging, needs the rotation of the patient for putting the body in the right condition of everyday gravitational mechanical load.

As readily deduced from the cited prior art (patents and publicly known devices shown above) all of the above needs are contrasting and cannot be satisfied by simply downsizing the dimensions of the magnet, since this would means less weight, less costs, smaller apparatus, but insufficient strength of the magnetic filed and difficulties in placing a patient positioning device inside the magnet, which needs to have a gantry sufficiently wide for allowing the bed supporting structure (carriage or static structure) to be put or to enter the gantry of the magnet. Larger distances between the poles means a need for a stronger field in order to have a sufficiently wide imaging volume in which the magnetic field homogeneity and the other electromagnetic disturbs or other drifts and aberrations do not damage image quality.

The aim of the present invention is to achieve a configuration allowing weight bearing diagnostic imaging in a possible extreme wide range of different positions of the patient and maintaining the field as high as possible despite the fact that the all-over dimensions of the device should remain within certain limits. Furthermore, since simply rotating the patient and not the magnets could determine different image qualities in the different positions of the patient, since the magnet is not rotated and the patient is displaced relative to the magnet, conditions are changed in rotating the patient alone which could lead to defects in the images. Thus, in the claimed invention, rotation of the magnet together with the patient solves the problem of changing the imaging conditions and of having a more reliable acquisition

condition for comparison of the images of the patient in the different positions relatively to gravity.

For at least the above reason, Applicants submit that the claims are not unpatentable over Damadian '490 in view of Eckels et al. or over Damadian '490, '165, and 574, Eckels and Carter.

The dependent claims define additional distinguishing aspects associated with the claimed invention. Since these dependent claims depend from an allowable independent claim, a detailed discussion of the additional distinguishing features recited in these dependent claims is not set forth at this time.

CONCLUSION

In view of the above amendments and remarks, Applicants respectfully submit that the claims of the present application are now in condition for allowance, and an early indication of the same is earnestly solicited.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference would be helpful in resolving any remaining issues pertaining to this application; the Examiner is kindly invited to call the undersigned counsel for Applicants regarding the same.

Respectfully submitted,
BUCHANAN INGERSOLL & ROONEY PC

Date: June 3, 2011

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